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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,011	08/09/2001	Mark C. Sullivan	SBTZ0030001	3597
34611	7590	05/16/2005	EXAMINER	
LAW OFFICE OF DUANE S. KOBAYASHI 1325 MURRAY DOWNS WAY RESTON, VA 20194			GHEBRETINSAE, TEMESGHEN	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/925,011

Applicant(s)

SULLIVAN, MARK C.

Examiner

Temesghen Ghebretinsae

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. It would be of great assistance to the Office if all incoming papers pertaining to a filed application carried the following items:

1. Application number (checked for accuracy, including series code and serial no.).
2. Group art unit number (copied from most recent Office communication).
3. Filing date.
4. Name of the examiner who prepared the most recent Office action.
5. Title of invention.
6. Confirmation number (See MPEP § 503).

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **"means for removing the dither signal"** of claim 4 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by O'Donnell et al (4,896,287)

5. O'Donnell discloses a CORDIC complex multiplier comprising: a phase accumulator; and a CORDIC phase rotator coupled to the phase accumulator comprising N stages, each stage having an in phase (I) input, a quadrature (Q) input and a phase angle (.theta.) input, each stage further comprising a first adder to compute a quantity $I + (-2)^{k-1} Q$, a second adder to compute a quantity $Q + (-2)^{k-1} I$ and a third adder to compute $\theta + \phi_{k-1}$, where each stage outputs the sum generated by each adder to be used as inputs to a succeeding stage, and wherein the Nth stage outputs an in phase component and a quadrature component from its first and second adders respectively that correspond to an input vector rotated by a desired phase angle. (See abstract, col. 1, lines 5-35, col.5, line 1-25, Eqs. 4(a), 4(b) and figs.1-4)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell in view of Palmer et al (RE-33629)

8. O'Donnell as applied to claims 1 and 9 above discloses the claimed invention except the means for stochastic rounding of value output by the CORDIC phase rotator. However, Palmer teaches that the means for stochastic rounding of value output by CORDIC phase rotator is required such that CORDIC approximations may be implemented in an integrated circuit chip of practical size, or at sufficient speed and accuracy. (Col 24, line 55 through col.5, line 25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a means for stochastic rounding of value output by the CORDIC phase rotator so as to implement the CORDIC approximation at sufficient speed and accuracy.

9. Claims 3-4 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell in view of Palmer et al (RE-33629) and further in view of Smith (5,963,157).

10. As described above, O'Donnell in view of Palmer teach the claimed invention except means for adding and removing dither signal. However, Smith teaches adding a dither signal to reduce the effect of non linearity in the D/A converter (see col.1, lines

13-15 and col. 3, lines 3-45) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a dither signal to reduce the effect of non linearity in the D/A converter. As for claim 4 and 12 the aliasing characteristic inherent in the D/A operation removes the dither signal. (See specification page 4, paragraph (0008). Thus it is well know in the art of communication that the aliasing characteristic inherent in the D/A (109,111) operation removes the dither signal.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Davis (6522176) and Vanka (6,693970) disclose a CORDIC phase rotator with phase accumulator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Temesghen Ghebretinsae whose telephone number is 571-272-3017. The examiner can normally be reached on Monday-Friday from 8 to 6. The examiner can also be reached on alternate

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel, can be reached on 571-272-2899. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should


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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Temesghen Ghebretinsae
Primary Examiner
Art Unit 2637

T.G.

5/12/05.



5/12/05

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER